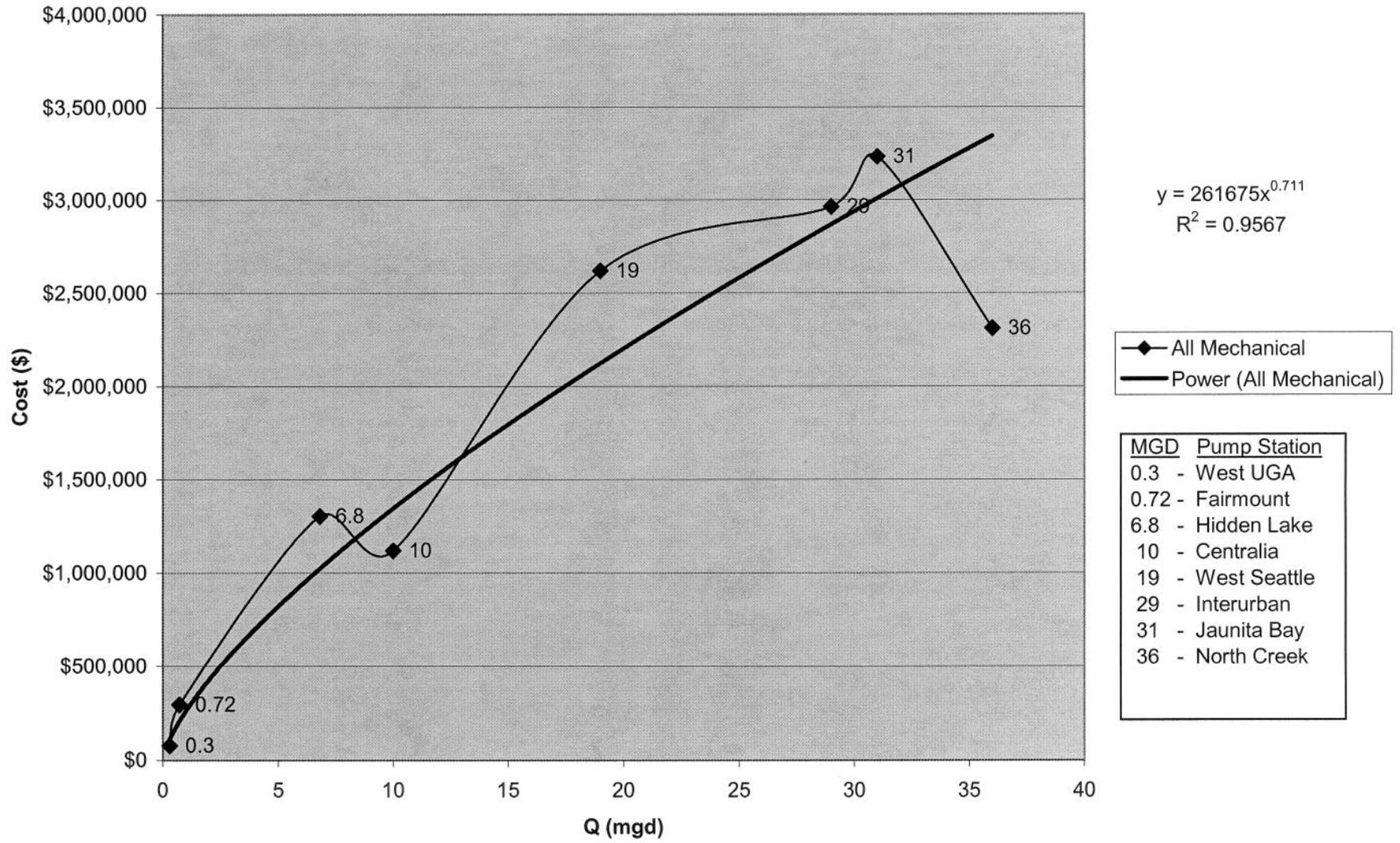
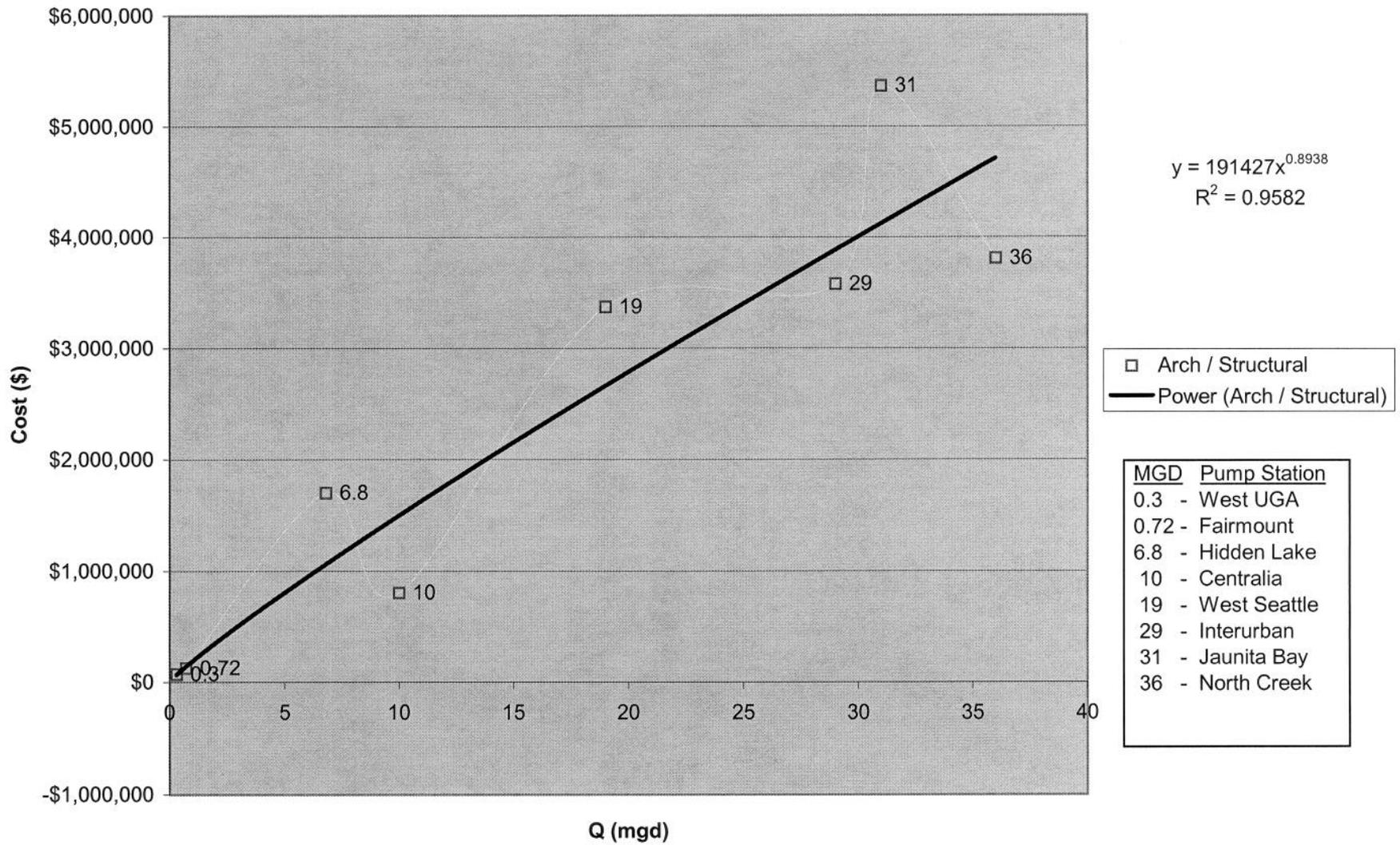


## **Appendix H: Pump Station Costs & Curves**

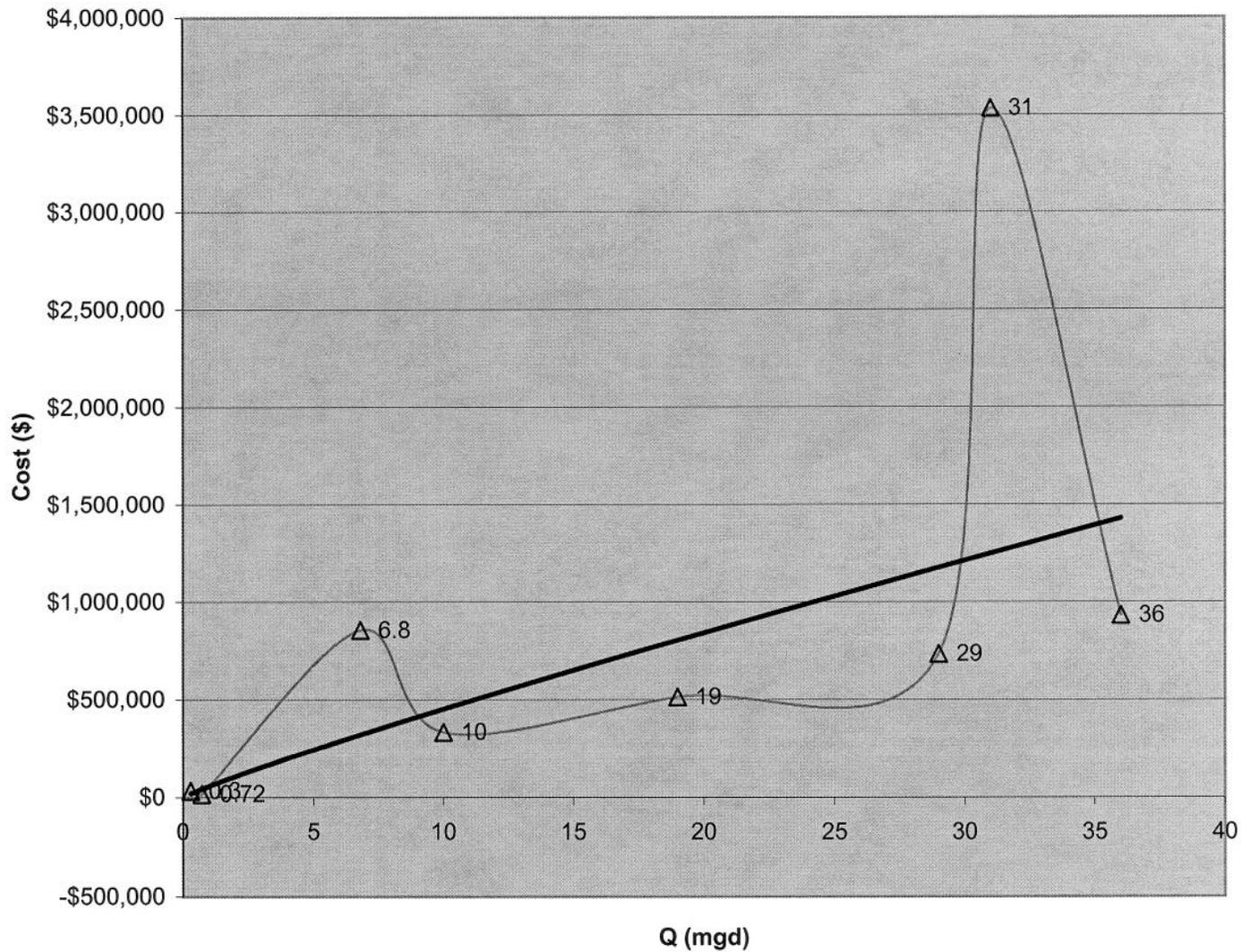
### Pump Stations All Mechanical



### Pump Stations Architectural/Structural



### Pump Stations Site Work



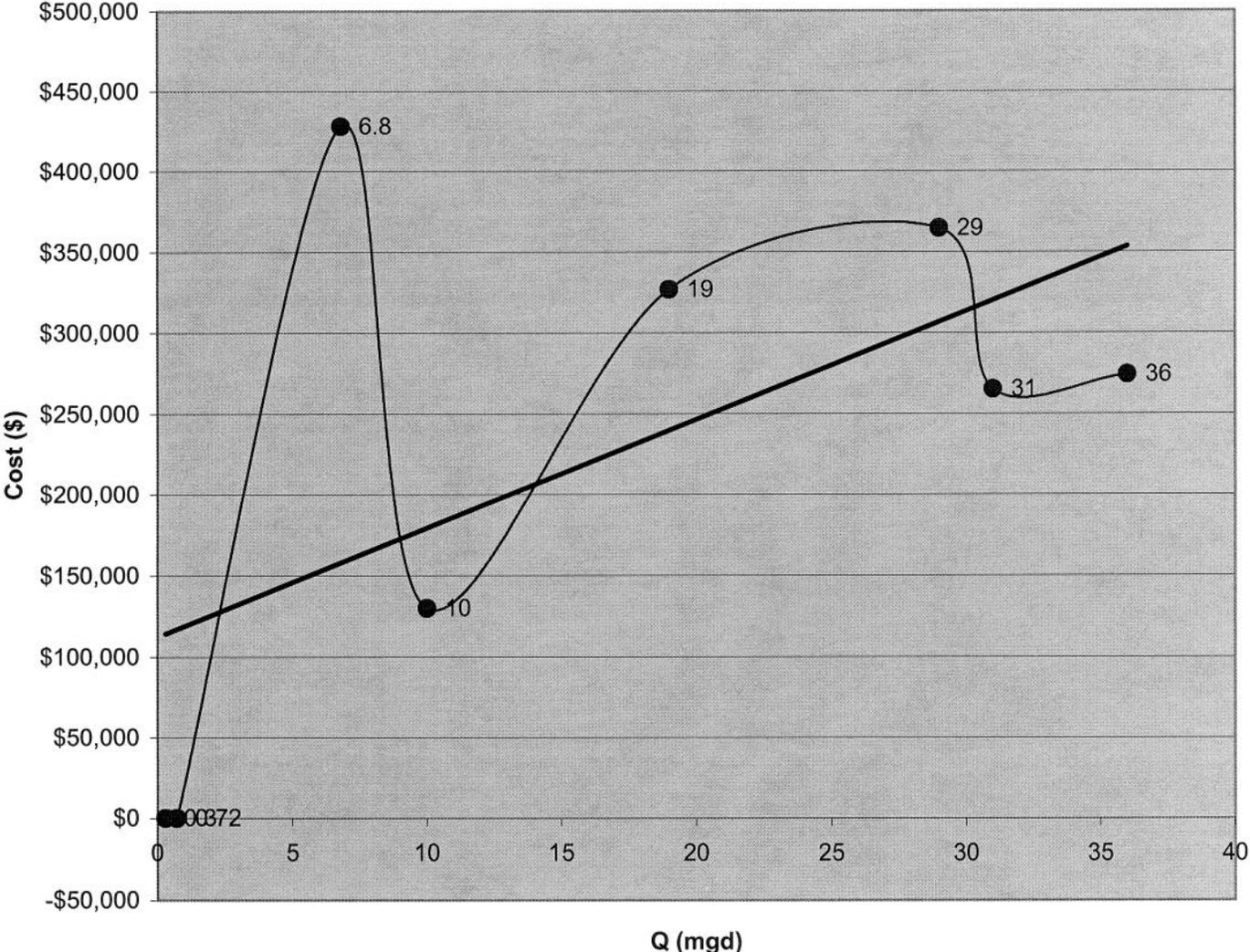
$$y = 56803x^{0.8995}$$

$$R^2 = 0.8303$$

▲ Sitework  
 — Power (Sitework)

MGD	Pump Station
0.3	West UGA
0.72	Fairmount
6.8	Hidden Lake
10	Centralia
19	West Seattle
29	Interurban
31	Jaunita Bay
36	North Creek

### Pump Stations Odor Control Unit and Chemical Systems

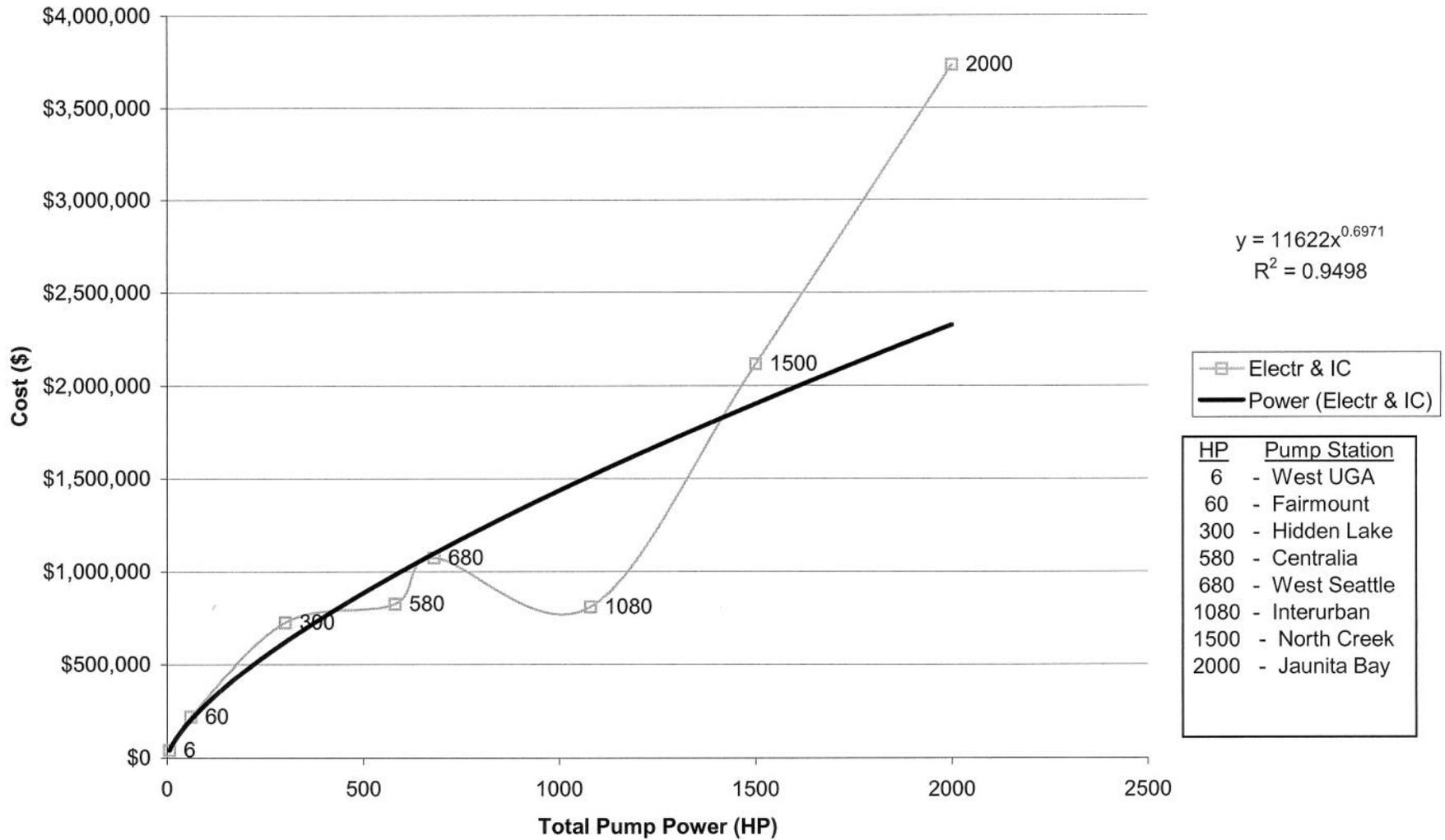


$y = 6697.3x + 112351$   
 $R^2 = 0.339$

● OCU + Chem  
 — Linear (OCU + Chem)

MGD	Pump Station
0.3	West UGA
0.72	Fairmount
6.8	Hidden Lake
10	Centralia
19	West Seattle
29	Interurban
31	Jaunita Bay
36	North Creek

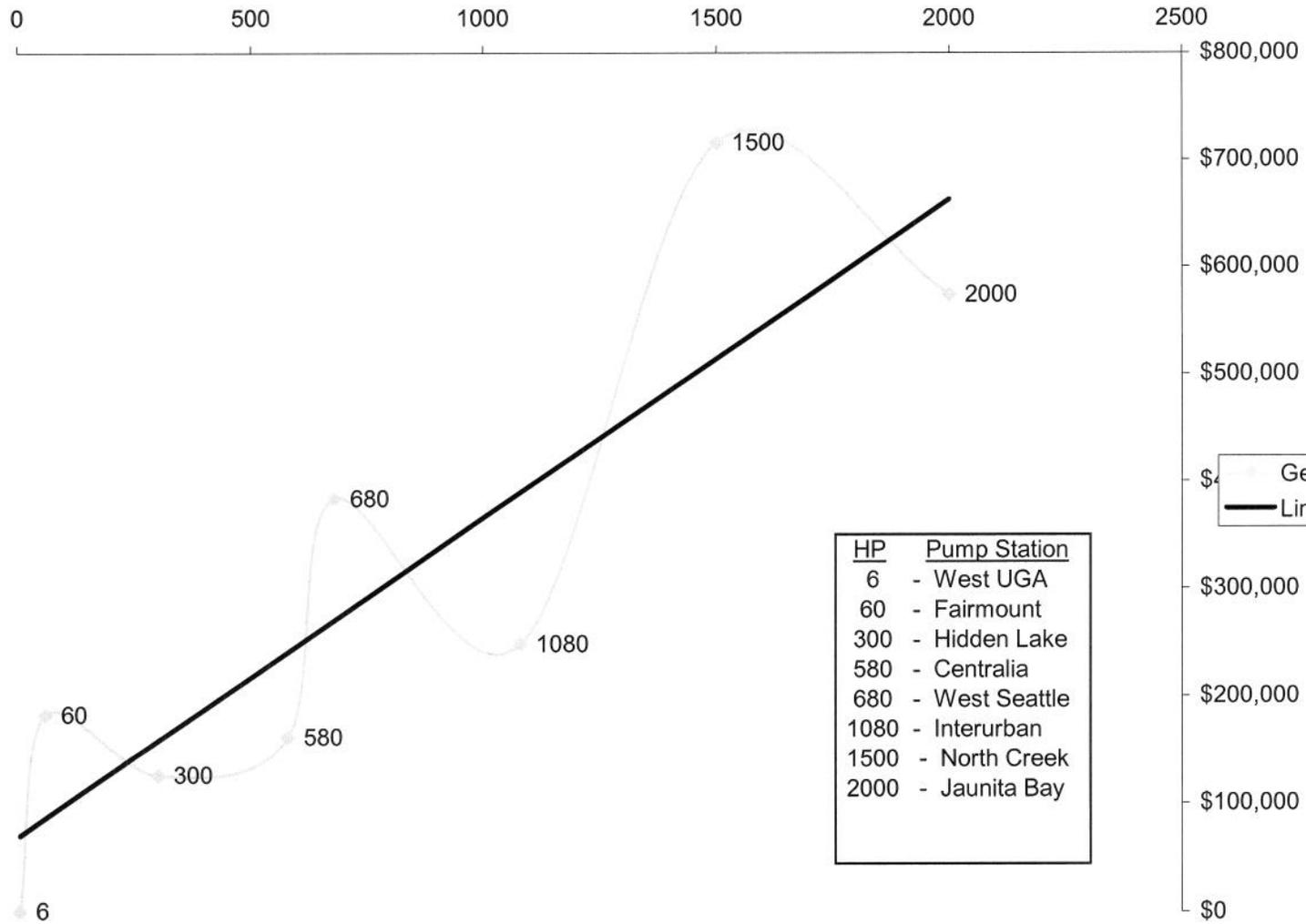
## Pump Stations Electrical and I&C Costs



### Pump Stations Generator System Costs

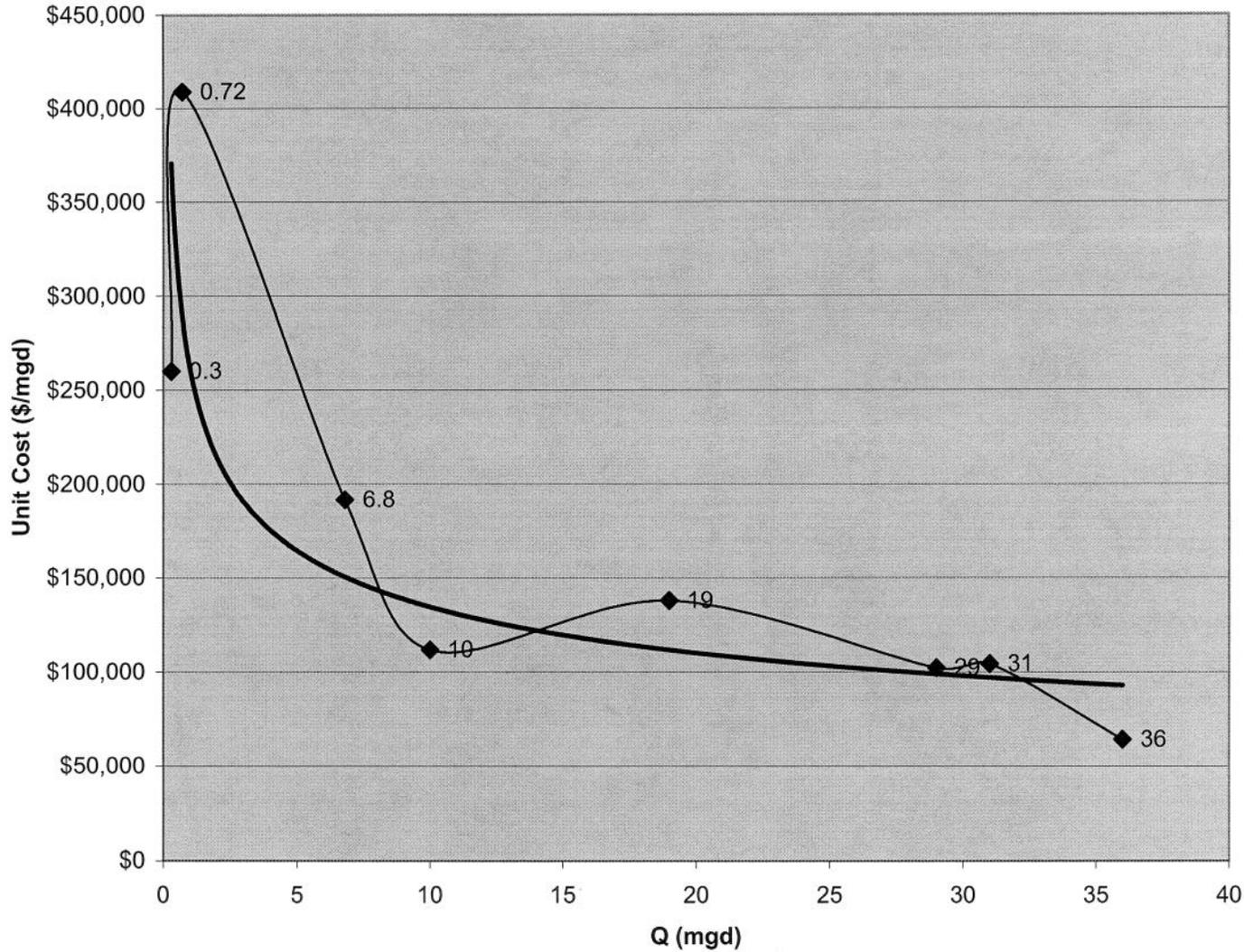
$$y = 297.33x + 67638$$

$$R^2 = 0.7508$$



HP	Pump Station
6	West UGA
60	Fairmount
300	Hidden Lake
580	Centralia
680	West Seattle
1080	Interurban
1500	North Creek
2000	Jaunita Bay

### Pump Stations (Unit Costs) All Mechanical



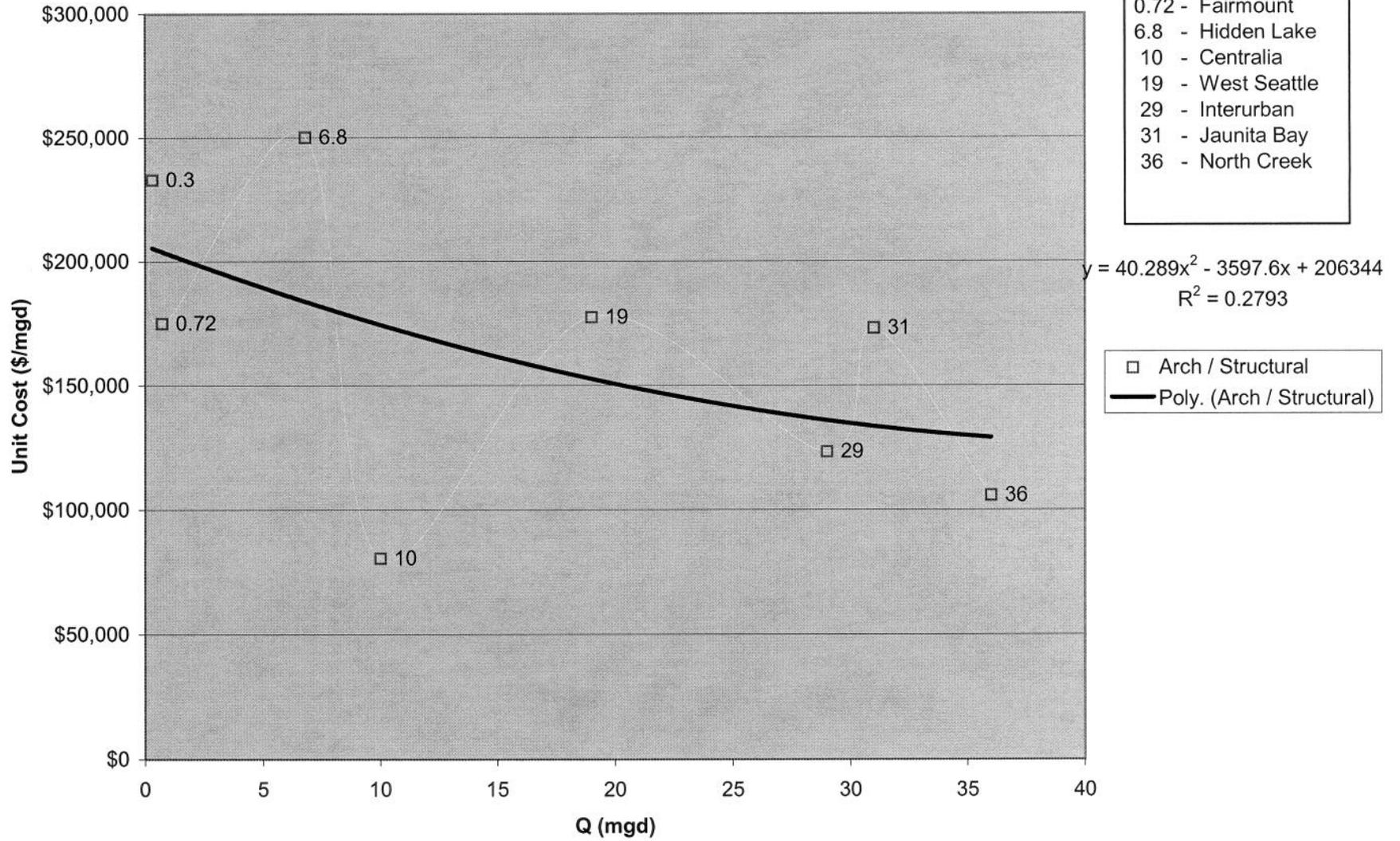
MGD	Pump Station
0.3	West UGA
0.72	Fairmount
6.8	Hidden Lake
10	Centralia
19	West Seattle
29	Interurban
31	Jaunita Bay
36	North Creek

◆ All Mechanical  
 — Power (All Mechanical)

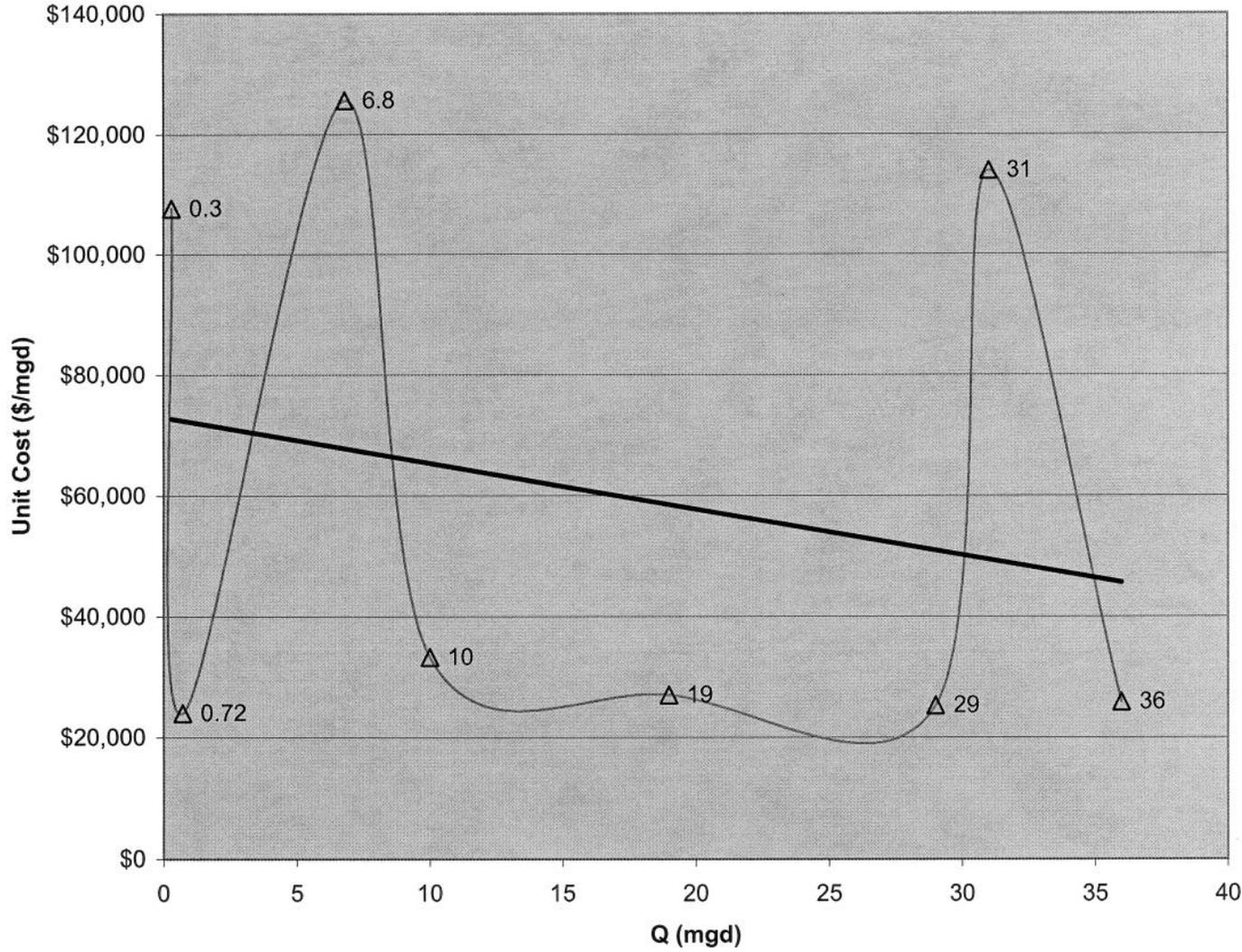
$$y = 261675x^{-0.289}$$

$$R^2 = 0.785$$

### Pump Stations (Unit Costs) Architectural/Structural



### Pump Stations (Unit Costs) Site Work

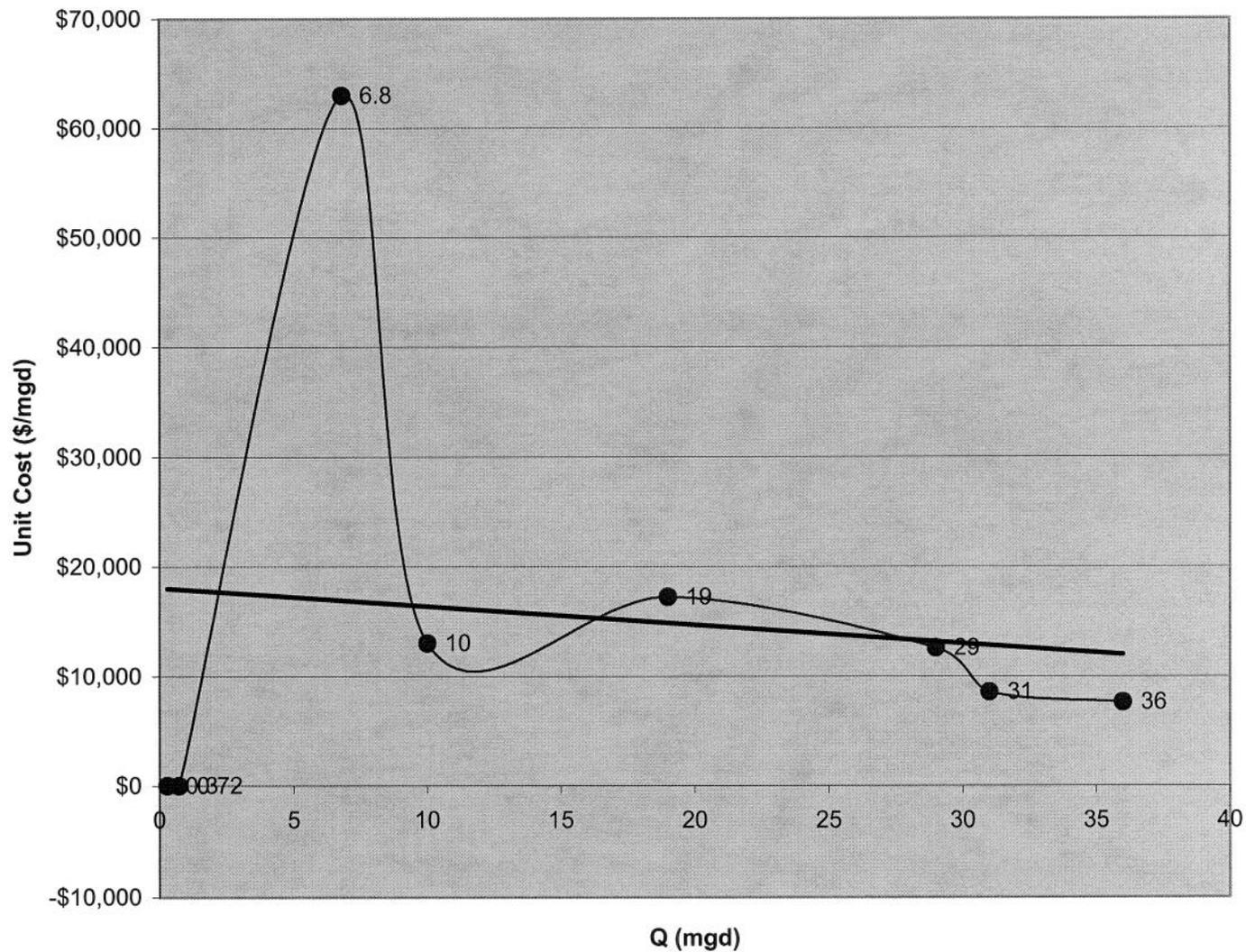


MGD	Pump Station
0.3	West UGA
0.72	Fairmount
6.8	Hidden Lake
10	Centralia
19	West Seattle
29	Interurban
31	Jaunita Bay
36	North Creek

▲ Sitework  
 — Linear (Sitework)

$y = -760.37x + 72937$   
 $R^2 = 0.0542$

### Pump Stations (Unit Costs) Odor Control + Chemical Systems

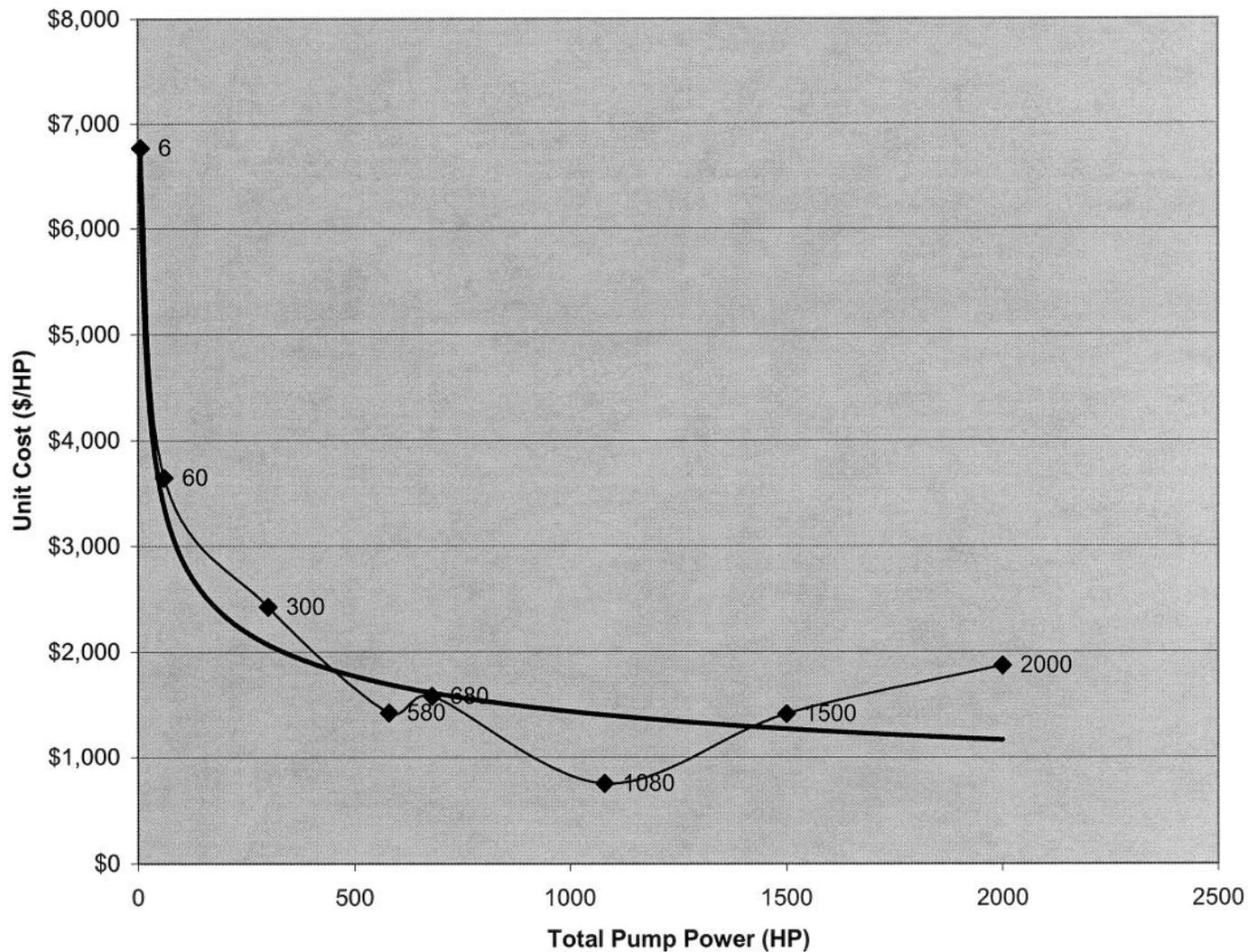


MGD	Pump Station
0.3	West UGA
0.72	Fairmount
6.8	Hidden Lake
10	Centralia
19	West Seattle
29	Interurban
31	Jaunita Bay
36	North Creek

● OCU + Chem  
 — Linear (OCU + Chem)

$y = -167.84x + 18021$   
 $R^2 = 0.0138$

### Pump Stations (Unit Costs) Electrical and I&C



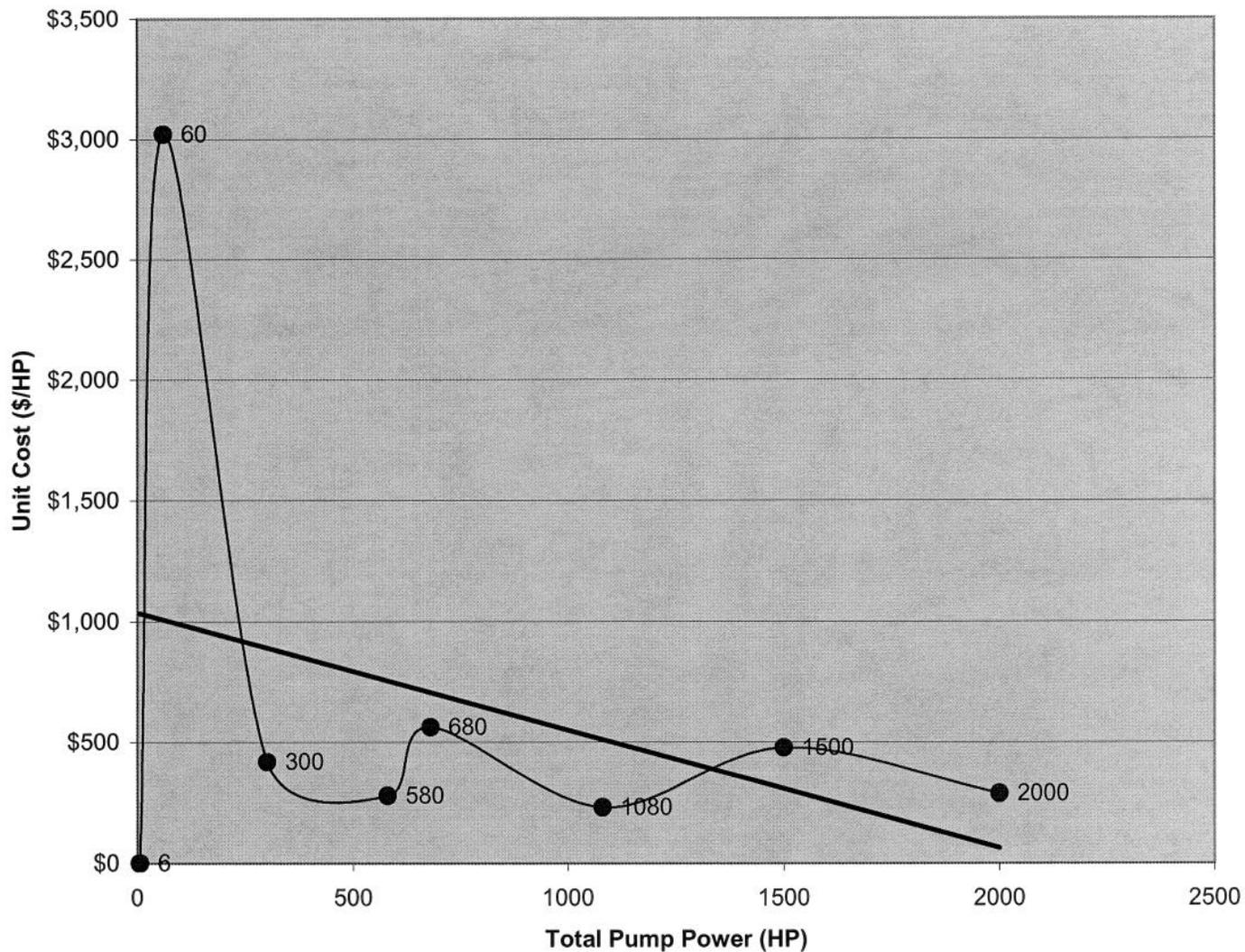
HP	Pump Station
6	West UGA
60	Fairmount
300	Hidden Lake
580	Centralia
680	West Seattle
1080	Interurban
1500	North Creek
2000	Jaunita Bay

◆ Electr & IC  
 — Power (Electr & IC)

$$y = 11622x^{-0.3029}$$

$$R^2 = 0.7812$$

### Pump Stations (Unit Costs) Generator



HP	Pump Station
6	West UGA
60	Fairmount
300	Hidden Lake
580	Centralia
680	West Seattle
1080	Interurban
1500	North Creek
2000	Jaunita Bay

● Generator  
 — Linear (Generator)

$$y = -0.4868x + 1036.3$$

$$R^2 = 0.1259$$

Pump Station	ENR Adjust	Q Firm (mgd)	Total Pump HP	Exc Depth	Pumps	Pipes & Mech Misc	Generator	Electr & IC	Chemical Feed System	Odor Control	Arch / Structural	Sitework	Total	Notes
<b>Existing Pump Station Data Points</b>														
Henderson Upgrade Adj from '99 to 9/05	1.210	22	500	?	\$604,705 \$731,575	\$186,935 \$226,155	\$278,680 \$337,149	\$652,630 \$789,555		\$48,930 \$59,196		\$665,834 \$805,530	\$2,437,714 \$2,949,159	
West Seattle Adj from '95 to 9/05	1.416	19	680	?	\$1,264,676 \$1,791,126	\$584,369 \$827,626	\$270,143 \$382,596	\$757,318 \$1,072,569	\$45,472 \$64,401	\$185,161 \$262,238	\$2,380,882 \$3,371,978	\$362,085 \$512,811	\$5,850,106 \$8,285,346	
Sweyolocken Adj from '99 to 9/05	1.210	23	800	?	\$1,651,139 \$1,997,557		\$476,880 \$576,932	\$1,252,511 \$1,515,294						
Interurban Adj from '92 to 9/05	1.572	29	1080	?	\$1,304,020 \$2,049,977	\$580,425 \$912,454	\$157,506 \$247,606	\$515,218 \$809,945	\$70,185 \$110,334	\$161,709 \$254,214	\$2,275,784 \$3,577,633	\$466,149 \$732,807	\$5,530,996 \$8,694,970	
North Creek Adj from '97 to 9/05	1.264	36	1500	?	\$1,431,550 \$1,808,841	\$396,007 \$500,376	\$566,289 \$715,537	\$1,674,428 \$2,115,731	\$60,144 \$75,995	\$156,800 \$198,125	\$3,013,249 \$3,807,403	\$736,589 \$930,720	\$8,035,056 \$10,152,729	
<b>New Pump Station Data Points</b>														
Centralia Adj from '02 to 9/05	1.109	10	580	37	\$447,587 \$496,596	\$560,558 \$621,936	\$144,608 \$160,442	\$743,268 \$824,652		\$117,082 \$129,902	\$726,531 \$806,082	\$299,868 \$332,702	\$3,039,503 \$3,372,313	Roll in 2% Contingency, add 6.5% to match low bidder, add 4% to adjust to Seattle location factor (RS Means), Removed Soldier Pile Walls from Sitework
Everett PS Modifications Adj from '03 to 9/05	1.092	32	1200	0	\$371,874 \$406,253	\$233,505 \$255,092		\$515,847 \$563,536			\$279,536	\$427,804		PS built on existing wet well so sitework and structural don't apply, add 4% to adjust to Seattle location factor (RS Means)
Juanita Bay Adj from 5/05 to 9/05	1.024	31	2000	60	\$1,439,411 \$1,473,842	\$1,717,605 \$1,758,690	\$560,540 \$573,948	\$3,644,576 \$3,731,754	\$66,434 \$68,023	\$192,383 \$196,985	\$5,241,022 \$5,366,387	\$3,450,572 \$3,533,109	\$16,312,543 \$16,702,738	Secant Wall shoring (\$2.9M) is included in sitework
Hidden Lake Adj from 8/05 to 9/05	1.000	6.8	300	17	\$955,581 \$955,581	\$346,731 \$346,731	\$125,000 \$125,000	\$725,734 \$725,734	\$115,497 \$115,497	\$312,629 \$312,629	\$1,700,663 \$1,700,663	\$854,011 \$854,011	\$5,135,846 \$5,135,846	Includes the demo of existing PS, small site with limited work area. PS built on sloping lot with the back of structure "daylighting". Low bidder dropped out cost based on 2nd bidder. KC cancelled contract to repackage and rebid.
Fairmount (Port Angeles) Adj from 6/05 to 9/05	1.022	0.72	60	0	\$100,403 \$102,629	\$187,666 \$191,827	\$177,260 \$181,190	\$213,780 \$218,521			\$123,250 \$125,983	\$16,907 \$17,282	\$819,266 \$837,432	Sitework partially done in previous contract. Add 4% to adjust to Seattle location factor (RS Means)

West UGA Sewer (Port Angeles)		0.3	6	20	\$33,387	\$42,957	\$39,727	\$68,324	\$31,567	\$215,962	Small Sewage PS in 96" MH with precast vault. Uses portable Gen Set in power outage. Add 4% to adjust to Seattle location factor (RS Means)
Adj from 6/05 to 9/05	1.022				\$34,127	\$43,910	\$40,608	\$69,839	\$32,267	\$220,751	

Pump Station	Escalation 1.176	mgd	TDH	Depth	
Richmond Beach	\$8,711,000	\$10,240,338	10	370	18
Medina	\$2,445,000	\$2,874,254	7.2	180	25
North Mercer	\$4,137,000	\$4,863,308	6	140	46
West Seattle	\$7,118,000	\$8,367,664	19	136	49
North Creek	\$9,848,000	\$11,576,954	36	160	34
Interurban	\$7,099,000	\$8,345,329	29	107	39
Centralia		\$3,372,313	10	160	35
Juanita Bay		\$16,702,738	30.6	278	60
Hidden Lake		\$5,135,846	6.8	154	17
West UGA Sewer		\$220,751	0.3	30	20

**Site/Civil Costs****Current Tabula Formula**

Site/Civil (\$)=\$20,000 x mgd + \$85,000

**Escalated Current Formula**

Site/Civil (\$)=\$23,500 x mgd + \$100,000

**New Curve Data Formula**Site/Civil (\$)=\$57,000 x mgd<sup>0.90</sup>**Cost Comparison**

mgd	Current	Escalated	New
1			\$56,803
5	\$185,000	\$220,000	\$241,599
10	\$285,000	\$340,000	\$450,683
15	\$385,000	\$460,000	\$649,031
20	\$485,000	\$580,000	\$840,713
25	\$585,000	\$700,000	\$1,027,586
30	\$685,000	\$820,000	\$1,210,715
35	\$785,000	\$940,000	\$1,390,787
40	\$885,000	\$1,060,000	\$1,568,282

**Pump Stations used to check against**

West UGA	0.3	\$91,000	\$107,200	\$19,288
North Mercer	6	\$205,000	\$244,000	\$285,898
Hidden Lake	6.8	\$221,000	\$263,200	\$319,987
Medina	7.2	\$229,000	\$272,800	\$336,879
Richmond Beach	10	\$285,000	\$340,000	\$452,767
Centralia	10	\$285,000	\$340,000	\$452,767
West Seattle	19	\$465,000	\$556,000	\$806,776
Interurban	29	\$665,000	\$796,000	\$1,180,410
Juanita Bay	31	\$697,000	\$834,400	\$1,238,865
North Creek	36	\$805,000	\$964,000	\$1,433,993

**Electrical/I&C Costs****Current Tabula Formula**

$$\text{Elect/I\&C (\$)} = \$1,500 \times \text{HP} + \$314,000$$

**Escalated Current Formula**

$$\text{Elect/I\&C (\$)} = \$1,750 \times \text{HP} + \$370,000$$

**New Curve Data Formula**

$$\text{Elect/I\&C (\$)} = \$12,000 \times \text{HP}^{0.70}$$

**Cost Comparison**

HP	Current	Escalated	New
200			\$489,669
300	\$764,000	\$895,000	\$650,378
500	\$1,064,000	\$1,245,000	\$929,951
750	\$1,439,000	\$1,682,500	\$1,235,163
1000	\$1,814,000	\$2,120,000	\$1,510,710
1250	\$2,189,000	\$2,557,500	\$1,766,112
1500	\$2,564,000	\$2,995,000	\$2,006,528
1750	\$2,939,000	\$3,432,500	\$2,235,156
2000	\$3,314,000	\$3,870,000	\$2,454,156

**Pump Stations used to check against**

West UGA	6	\$323,000	\$380,500	\$42,062
North Mercer	289	\$747,500	\$875,750	\$633,592
Hidden Lake	300	\$764,000	\$895,000	\$650,378
Medina	446	\$983,000	\$1,150,500	\$858,451
Centralia	580	\$1,184,000	\$1,385,000	\$1,031,765
West Seattle	680	\$1,334,000	\$1,560,000	\$1,153,287
Interurban	1080	\$1,934,000	\$2,260,000	\$1,594,329
Richmond Beach	1273	\$2,223,500	\$2,597,750	\$1,788,797
North Creek	1500	\$2,564,000	\$2,995,000	\$2,006,528
Juanita Bay	2000	\$3,314,000	\$3,870,000	\$2,454,156

**Architectural/Structural Costs**

**Current Tabula Formula**

Arch/Struct (\$/mgd)=\$0.42 x mgd<sup>-0.47</sup> x 10<sup>6</sup>

**Escalated Current Formula**

Arch/Struct (\$/mgd)=\$0.49 x mgd<sup>-0.47</sup> x 10<sup>6</sup>

**New Curve Data Formula**

Arch/Struct (\$/mgd)=\$40.29 x mgd<sup>2</sup> - \$3,597 x mgd +\$206,344

**Architectural/Structural Adjustment**

**Current Tabula Formula**

Arch/Struct Adj (\$/mgd)=\$0.20x((Excavation-30)/30+0.01x(TDH-120)/120)x10<sup>6</sup>

**Escalated Current Formula**

Arch/Struct Adj (\$/mgd)=\$0.24x((Excavation-30)/30+0.01x(TDH-120)/120)x10<sup>6</sup>

**New Curve Data Formula**

**Cost Comparison**

mgd	Current	Escalated	New
1			\$202,787
5	\$197,121	\$229,975	\$189,366
10	\$142,315	\$166,034	\$174,403
15	\$117,621	\$137,225	\$161,454
20	\$102,746	\$119,870	\$150,520
25	\$92,516	\$107,935	\$141,600
30	\$84,918	\$99,072	\$134,695
35	\$78,984	\$92,148	\$129,804
40	\$74,179	\$86,542	\$126,928

**Cost Comparison**

Depth	TDH	Current	Escalated	New
31	30	\$5,167	\$6,200	
46	140	\$107,000	\$128,400	
28	154	-\$12,767	-\$15,320	
25	180	-\$32,333	-\$38,800	
18	370	-\$75,833	-\$91,000	
37	160	\$47,333	\$56,800	
49	136	\$126,933	\$152,320	
39	107	\$59,783	\$71,740	
60	278	\$202,633	\$243,160	
34	160	\$27,333	\$32,800	

**Pump Stations used to check against**

West UGA	0.3	\$739,609	\$862,877	\$205,269
North Mercer	6	\$180,933	\$211,089	\$186,212
Hidden Lake	6.8	\$170,596	\$199,029	\$183,747
Medina	7.2	\$166,075	\$193,754	\$182,534
Richmond Beach	10	\$142,315	\$166,034	\$174,403
Centralia	10	\$142,315	\$166,034	\$174,403
West Seattle	19	\$105,253	\$122,795	\$152,546
Interurban	29	\$86,282	\$100,663	\$135,915
Juanita Bay	31	\$84,132	\$98,154	\$134,002
North Creek	36	\$77,945	\$90,936	\$129,068

**Base Mechanical Costs**

**Current Tabula Formula**

Base Mech (\$/mgd)=\$0.33 x mgd<sup>-0.43</sup> x 10<sup>6</sup>

**Escalated Current Formula**

Base Mech (\$/mgd)=\$0.39 x mgd<sup>-0.43</sup> x 10<sup>6</sup>

**New Curve Data Formula**

Base Mech (\$/mgd)=\$261,700 x mgd<sup>-0.289</sup>

**Cost Comparison**

mgd	Current	Escalated	New
1			\$261,935
5	\$197,121	\$229,975	\$225,720
10	\$142,315	\$166,034	\$187,409
15	\$117,621	\$137,225	\$155,601
20	\$102,746	\$119,870	\$129,191
25	\$92,516	\$107,935	\$107,264
30	\$84,918	\$99,072	\$89,059
35	\$78,984	\$92,148	\$73,943
40	\$74,179	\$86,542	\$61,393

**Pump Stations used to check against**

West UGA	0.3	\$739,609	\$862,877	\$370,609
North Mercer	6	\$180,933	\$211,089	\$155,926
Hidden Lake	6.8	\$170,596	\$199,029	\$150,386
Medina	7.2	\$166,075	\$193,754	\$147,923
Richmond Beach	10	\$142,315	\$166,034	\$134,525
Centralia	10	\$142,315	\$166,034	\$134,525
West Seattle	19	\$105,253	\$122,795	\$111,749
Interurban	29	\$86,282	\$100,663	\$98,894
Juanita Bay	31	\$84,132	\$98,154	\$97,371
North Creek	36	\$77,945	\$90,936	\$92,904

**Mechanical Adjustment**

**Current Tabula Formula**

Mech Adj (\$/mgd)=\$0.05x((TDH-120)/120)x10<sup>6</sup>

For TDH over 300 use 1.2 x Base Mech Cost

**Escalated Current Formula**

Mech Adj (\$/mgd)=\$0.06x((TDH-120)/120)x10<sup>6</sup>

**New Curve Data Formula**

**Cost Comparison**

TDH	Current	Escalated	New
30	-\$37,500	-\$45,000	
140	\$8,333	\$10,000	
154	\$14,167	\$17,000	
180	\$25,000	\$30,000	
370	\$170,777	\$199,240	Over 300 TDH
160	\$16,667	\$20,000	
136	\$6,667	\$8,000	
107	-\$5,417	-\$6,500	
278	\$65,833	\$79,000	
160	\$16,667	\$20,000	

## Pump Station Curve Costs vs Actual Costs

### Pump Station Verification Costs

Pump Station	mgd	Year of Construction	Escalation to 9/05 using Seattle ENR Index	Actual Construction Cost <sup>2</sup>	Construction Cost Escalated to 9/05 Dollars	Current Tabula Formula (12/99 Dollars)	Cost Using Escalated Tabula Costs Formula (9/05 dollars)	% Difference	Construction Cost Using New Formula (9/05 dollars)	% Difference
West UGA	0.3	Jun-05	1.022	\$215,962	\$220,750	\$848,066	\$993,786	350%	\$222,473	1%
North Mercer <sup>1</sup>	6	Dec-99	1.176	\$4,137,000	\$4,863,308	\$3,815,698	\$4,483,214	-8%	\$3,802,719	-22%
Hidden Lake	6.8	Aug-05	1.000	\$5,136,000	\$5,136,000	\$3,314,632	\$3,893,784	-24%	\$3,271,263	-36%
Medina <sup>1</sup>	7.2	Dec-99	1.176	\$2,445,000	\$2,874,254	\$3,550,673	\$4,149,992	44%	\$3,511,260	22%
Richmond Beach <sup>1</sup>	10	Dec-99	1.176	\$8,711,000	\$10,240,338	\$5,638,124	\$6,598,423	-36%	\$5,670,847	-45%
Centralia	10	Jun-02	1.109	\$3,039,503	\$3,372,313	\$4,955,291	\$5,813,673	72%	\$5,341,814	58%
West Seattle	19	Jun-95	1.416	\$7,118,000	\$8,367,664	\$8,337,020	\$9,828,303	17%	\$10,027,744	20%
Interurban	29	Sep-91	1.572	\$7,099,000	\$8,345,329	\$9,180,013	\$10,786,403	29%	\$11,476,162	38%
Juanita Bay	30.6	May-05	1.024	\$16,312,543	\$16,702,738	\$17,374,947	\$20,569,507	23%	\$20,631,128	24%
North Creek	36	Jun-97	1.264	\$9,848,000	\$11,576,954	\$10,565,025	\$12,407,163	7%	\$13,332,291	15%

**Note 1:** These pump stations were previously escalated to December 1999 dollars by HDR for use in checking the original pump station curve costs and are included for continuity purposes.

**Note 2:** All costs shown are construction costs and don't include engineering, legal, admin or allied costs.

## Pump Station Curve Costs vs Actual Costs

**Project Name: West UGA Sewer Pump Station**

Firm Capacity (mgd): 0.3  
 TDH (ft): 30  
 Ground Surface Elevation (ft):  
 Influent Pipe Invert (ft):  
 Pump Power (HP): 6  
 Excavation Depth (ft): 31

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$323,000	\$380,500	\$42,062
Site/Civil:	\$91,000	\$107,200	\$19,288
Arch/Struct:	\$221,883	\$258,863	\$61,581
Arch/Struct Adj:	\$1,550	\$1,860	\$1,860
Mechanical:	\$221,883	\$258,863	\$111,183
Mech Adj:	-\$11,250	-\$13,500	-\$13,500
	\$848,066	\$993,786	\$222,473

Actual Cost (Dec 1999 Dollars)  
 Actual Cost (Escalated 2005 Dollars) \$220,750

**Project Name: North Mercer**

Firm Capacity (mgd): 6  
 TDH (ft): 140  
 Ground Surface Elevation (ft): 135  
 Influent Pipe Invert (ft): 100  
 Pump Power (HP): 289  
 Excavation Depth (ft): 46

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$747,500	\$875,750	\$633,592
Site/Civil:	\$205,000	\$244,000	\$285,898
Arch/Struct:	\$1,085,599	\$1,266,532	\$1,117,275
Arch/Struct Adj:	\$642,000	\$770,400	\$770,400
Mechanical:	\$1,085,599	\$1,266,532	\$935,555
Mech Adj:	\$50,000	\$60,000	\$60,000
	\$3,815,698	\$4,483,214	\$3,802,719

Actual Cost (Dec 1999 Dollars) \$4,137,000  
 Actual Cost (Escalated 2005 Dollars) \$4,863,308

## Pump Station Curve Costs vs Actual Costs

**Project Name: Hidden Lake**

Firm Capacity (mgd): 6.8  
 TDH (ft): 120  
 Ground Surface Elevation (ft):  
 Influent Pipe Invert (ft):  
 Pump Power (HP) 300  
 Excavation Depth (ft): 28

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$764,000	\$895,000	\$650,378
Site/Civil:	\$221,000	\$263,200	\$319,987
Arch/Struct:	\$1,160,056	\$1,353,399	\$1,249,482
Arch/Struct Adj:	-\$86,813	-\$86,813	-\$86,813
Mechanical:	\$1,160,056	\$1,353,399	\$1,022,628
Mech Adj:	\$96,333	\$115,600	\$115,600
	\$3,314,632	\$3,893,784	\$3,271,263

Actual Cost (Dec 1999 Dollars)  
 Actual Cost (Escalated 2005 Dollars) \$5,136,000

**Project Name: Medina**

Firm Capacity (mgd): 7.2  
 TDH (ft): 180  
 Ground Surface Elevation (ft): 151  
 Influent Pipe Invert (ft): 137  
 Pump Power (HP) 446  
 Excavation Depth (ft): 25

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$983,000	\$1,150,500	\$858,451
Site/Civil:	\$229,000	\$272,800	\$336,879
Arch/Struct:	\$1,195,737	\$1,395,026	\$1,314,246
Arch/Struct Adj:	-\$232,800	-\$279,360	-\$279,360
Mechanical:	\$1,195,737	\$1,395,026	\$1,065,043
Mech Adj:	\$180,000	\$216,000	\$216,000
	\$3,550,673	\$4,149,992	\$3,511,260

Actual Cost (Dec 1999 Dollars) \$2,445,000  
 Actual Cost (Escalated 2005 Dollars) \$2,874,254

## Pump Station Curve Costs vs Actual Costs

**Project Name: Richmond Beach**

Firm Capacity (mgd): 10  
 TDH (ft): 370  
 Ground Surface Elevation (ft): 123  
 Influent Pipe Invert (ft): 116  
 Pump Power (HP): 1273  
 Excavation Depth (ft): 18

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$2,223,500	\$2,597,750	\$1,788,797
Site/Civil:	\$285,000	\$340,000	\$452,767
Arch/Struct:	\$1,423,145	\$1,660,336	\$1,744,030
Arch/Struct Adj:	-\$758,333	-\$910,000	-\$910,000
Mechanical:	\$1,423,145	\$1,660,336	\$1,345,252
Mech Adj:	\$1,041,667	\$1,250,000	\$1,250,000
	\$5,638,124	\$6,598,423	\$5,670,847

Actual Cost (Dec 1999 Dollars) \$8,711,000  
 Actual Cost (Escalated 2005 Dollars) \$10,240,338

**Project Name: Centralia**

Firm Capacity (mgd): 10  
 TDH (ft): 160  
 Ground Surface Elevation (ft):  
 Influent Pipe Invert (ft):  
 Pump Power (HP): 580  
 Excavation Depth (ft): 37

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$1,184,000	\$1,385,000	\$1,031,765
Site/Civil:	\$285,000	\$340,000	\$452,767
Arch/Struct:	\$1,423,145	\$1,660,336	\$1,744,030
Arch/Struct Adj:	\$473,333	\$568,000	\$568,000
Mechanical:	\$1,423,145	\$1,660,336	\$1,345,252
Mech Adj:	\$166,667	\$200,000	\$200,000
	\$4,955,291	\$5,813,673	\$5,341,814

Actual Cost (Dec 1999 Dollars)  
 Actual Cost (Escalated 2005 Dollars) \$3,372,313

## Pump Station Curve Costs vs Actual Costs

**Project Name: West Seattle**

Firm Capacity (mgd): 19  
 TDH (ft): 136  
 Ground Surface Elevation (ft): 122  
 Influent Pipe Invert (ft): 84  
 Pump Power (HP): 680  
 Excavation Depth (ft): 49

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$1,334,000	\$1,560,000	\$1,153,287
Site/Civil:	\$465,000	\$556,000	\$806,776
Arch/Struct:	\$1,999,810	\$2,333,111	\$2,898,368
Arch/Struct Adj:	\$2,411,733	\$2,894,080	\$2,894,080
Mechanical:	\$1,999,810	\$2,333,111	\$2,123,232
Mech Adj:	\$126,667	\$152,000	\$152,000
	<b>\$8,337,020</b>	<b>\$9,828,303</b>	<b>\$10,027,744</b>

Actual Cost (Dec 1999 Dollars) \$7,118,000  
 Actual Cost (Escalated 2005 Dollars) \$8,367,664

**Project Name: Interurban**

Firm Capacity (mgd): 29  
 TDH (ft): 107  
 Ground Surface Elevation (ft): 117  
 Influent Pipe Invert (ft): 89  
 Pump Power (HP): 1080  
 Excavation Depth (ft): 39

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$1,934,000	\$2,260,000	\$1,594,329
Site/Civil:	\$665,000	\$796,000	\$1,180,410
Arch/Struct:	\$2,502,190	\$2,919,221	\$3,941,532
Arch/Struct Adj:	\$1,733,717	\$2,080,460	\$2,080,460
Mechanical:	\$2,502,190	\$2,919,221	\$2,867,931
Mech Adj:	-\$157,083	-\$188,500	-\$188,500
	<b>\$9,180,013</b>	<b>\$10,786,403</b>	<b>\$11,476,162</b>

Actual Cost (Dec 1999 Dollars) \$7,099,000  
 Actual Cost (Escalated 2005 Dollars) \$8,345,329

## Pump Station Curve Costs vs Actual Costs

**Project Name: Juanita Bay**

Firm Capacity (mgd): 30.6  
 TDH (ft): 278  
 Ground Surface Elevation (ft):  
 Influent Pipe Invert (ft):  
 Pump Power (HP) 2000  
 Excavation Depth (ft): 60

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$697,000	\$834,400	\$1,238,865
Site/Civil:	\$3,314,000	\$3,870,000	\$2,454,156
Arch/Struct:	\$2,574,433	\$3,003,506	\$4,100,453
Arch/Struct Adj:	\$6,200,580	\$7,440,696	\$7,440,696
Mechanical:	\$2,574,433	\$3,003,506	\$2,979,557
Mech Adj:	\$2,014,500	\$2,417,400	\$2,417,400
	\$17,374,947	\$20,569,507	\$20,631,128

Actual Cost (Dec 1999 Dollars) \$16,312,543  
 Actual Cost (Escalated 2005 Dollars) \$16,702,738

**Project Name: North Creek**

Firm Capacity (mgd): 36  
 TDH (ft): 160  
 Ground Surface Elevation (ft): 131  
 Influent Pipe Invert (ft): 108  
 Pump Power (HP) 1500  
 Excavation Depth (ft): 34

	Current Formula	Escalated Formula	New Formula
Electrical & I/C:	\$2,564,000	\$2,995,000	\$2,006,528
Site/Civil:	\$805,000	\$964,000	\$1,433,993
Arch/Struct:	\$2,806,013	\$3,273,681	\$4,646,442
Arch/Struct Adj:	\$984,000	\$1,180,800	\$1,180,800
Mechanical:	\$2,806,013	\$3,273,681	\$3,344,528
Mech Adj:	\$600,000	\$720,000	\$720,000
	\$10,565,025	\$12,407,163	\$13,332,291

Actual Cost (Dec 1999 Dollars) \$9,848,000  
 Actual Cost (Escalated 2005 Dollars) \$11,576,954